

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claims 1 – 12 (cancelled)

Claim 13 (currently amended): A method for processing aluminum in a furnace, in which an aluminum-containing material ~~is and, optionally, one or more salts, are~~ introduced into the furnace, comprising:

~~this material is melted~~ melting the material by heating using at least one burner supplied with oxidizer and with fuel, in order to obtain molten aluminum; ~~possibly covered with a slag comprising, in particular, alumina and at least one salt, and the~~

measuring at least one of carbon monoxide CO and [[or]] hydrogen H₂ concentration ~~is measured in the~~ at least one of a furnace atmosphere [[or in]] ~~and the~~ flue gases, wherein the oxidizer supplied to at least one burner comprises over about 10% by volume of oxygen; ~~and, preferably over about 21% by volume of oxygen, and in that the method comprises a final phase for~~

decreasing the oxidation of the molten aluminum in an oxidation limitation phase, during which (i) flow rate of the oxidizer flow rate is substantially constant while the flow rate of the fuel injected into the at least one burner is a function of at least one of the carbon monoxide and [[or]] hydrogen concentration in at least one of the atmosphere [[or]] and the flue gases or (ii) the flow rate of the fuel is substantially constant while the flow rate of the oxidizer is a function of at least one of the carbon monoxide and hydrogen concentration in at least one of the atmosphere and the flue gases vice versa, at least one of this carbon monoxide and [[or]] hydrogen concentration being regulated, upon the decreasing, to a setpoint C2 of between about 3 vol% and about 15 vol%, wherein, prior to the decreasing, at least one of the carbon monoxide and hydrogen concentration is regulated to a setpoint C1 different than the setpoint C2.

Claim 14 (previously presented): The method of claim 13, wherein the oxidizer comprises over about 88 vol% of O₂, ~~preferably over about 95 vol% of O₂.~~

Claim 15 (previously presented): The method of claim 13, wherein the oxidizer is industrially pure oxygen.

Claim 16 (previously presented): The method of claim 13, wherein the fuel is selected from natural gas, hydrocarbons, and light or heavy fuel oil.

Claim 17 (previously presented): The method of claim 13, wherein ~~the~~ volumetric ratio of oxygen to fuel is maintained between about 1 and about 5, ~~preferably between about 1.5 and about 3.~~

Claim 18 (currently amended): The method of claim 13, wherein the carbon monoxide and/or hydrogen concentration is maintained substantially constant throughout this oxidation limitation phase at ~~a value~~ the setpoint C2 ~~of between about 3 vol% and about 15 vol%, preferably between about 6 vol% and about 10 vol%.~~

Claim 19 (currently amended): The method of claim 13, wherein the oxidation limitation phase is preceded by a hydrocarbon combustion phase during which substantially all ~~the~~ organic compounds present in the material are destroyed by pyrolysis.

Claim 20 (currently amended): The method of claim 19, wherein the hydrocarbon combustion phase is considered to terminate when ~~the a~~ measured value of ~~the a~~ ratio R of the volumetric flow rate of oxygen to ~~the~~ volumetric flow rate of fuel falls below a predefined value S.

Claim 21 (currently amended): The method of claim ~~[[19]]~~ 20, wherein a stabilization phase takes place with a measured CO and/or H₂ concentration

regulated to the setpoint C1, this phase terminating when the ratio R reaches its minimum.

Claim 22 (currently amended): The method of claim 13, wherein the ~~aluminum~~ oxidation limitation phase terminates with ~~the~~ reintroduction, into the furnace, of a new charge of aluminum-containing material.

Claim 23 (previously presented): The method of claim 13, wherein the CO concentration is measured using a laser diode.

Claim 24 (canceled)

Claim 25 (new): The method of claim 13, wherein volumetric ratio of oxygen to fuel is maintained between about 1.5 and about 3.

Claim 26 (new): The method of claim 13, wherein the carbon monoxide and/or hydrogen concentration is maintained substantially constant throughout the oxidation limitation phase at the setpoint C2 of between about 6 vol% and about 10 vol%.

Claim 27 (new): A method for processing aluminum in a furnace, in which an aluminum-containing material is introduced into the furnace, comprising:

melting the material by heating using at least one burner supplied with oxidizer and with fuel, in order to obtain molten aluminum;

measuring at least one of carbon monoxide CO and hydrogen H₂ concentration in at least one of a furnace atmosphere and flue gases, wherein the oxidizer supplied to at least one burner comprises over about 10% by volume of oxygen;

regulating at least one of the carbon monoxide and hydrogen to a setpoint C1 while the molten aluminum is maintained in a first phase, wherein regulating to the setpoint C1 comprises (i) adjusting flow rate of the fuel injected into the at least one burner as a function of at least one of the carbon monoxide and

hydrogen concentration in at least one of the atmosphere and the flue gases while flow rate of the oxidizer is substantially constant or (ii) adjusting the flow rate of the oxidizer as a function of at least one of the carbon monoxide and hydrogen concentration in at least one of the atmosphere and the flue gases while the flow rate of the fuel is substantially constant; and

regulating at least one of the carbon monoxide and hydrogen to a setpoint C2 while oxidation of the molten aluminum is decreased in a second phase, wherein regulating to the setpoint C2 comprises (i) adjusting the flow rate of the fuel injected into the at least one burner as a function of at least one of the carbon monoxide and hydrogen concentration in at least one of the atmosphere and the flue gases while the flow rate of the oxidizer is substantially constant or (ii) adjusting the flow rate of the oxidizer as a function of at least one of the carbon monoxide and hydrogen concentration in at least one of the atmosphere and the flue gases while the flow rate of the fuel is substantially constant, wherein the setpoint C2 is different than the setpoint C1 and is between about 3 vol% and about 15 vol%.